

63 of 172 DOCUMENTS

UNITED STATES PATENT AND TRADEMARK OFFICE PRE-GRANT
PUBLICATION

20070107270

(Note: This is a Patent Application only.)

[Link to Claims Section](#)

May 17, 2007

Attachment for Heavy Equipment Vehicles

INVENTOR: Edmond, David - Pevely, Missouri, United States (US)

APPL-NO: 555552 (11)

FILED-DATE: November 1, 2006

LEGAL-REP: GREENBERG & LIEBERMAN, LLC - 2141 WISCONSIN AVE, N.W. SUITE C-2, WASHINGTON,
District of Columbia, 20007

PUB-TYPE: May 17, 2007 - Utility Patent Application Publication (A1)

PUB-COUNTRY: United States (US)

REL-DATA:

Provisional Application Ser. No. 60596956, November 1, 2005, PENDING

US-MAIN-CL: 37#403

CL: 37

IPC-MAIN-CL: [8] E02F 003#96 (20060101) Advanced Inventive 20070517 (A F I B H US)

ENGLISH-ABST:

An attachment for a heavy equipment vehicle, which comprises four different functions. The attachment can serve as a box blade, grapple, ripper, or bucket with front cutting edge. It is highly convenient for a user who wishes to accomplish multiple tasks without having to change the attachment on the vehicle, thus saving time and money on the worksite. The attachment is hydraulically controlled, similar to any other vehicle attachment.

NO-OF-CLAIMS: 1

NO-DRWNG-PP: 1

SUMMARY:

FIELD OF THE INVENTION

[0001] The present invention relates to an attachment for heavy equipment vehicles; particularly, it relates to an attachment for existing construction, farming, and industrial vehicles that is able to perform four different functions.

BACKGROUND OF THE INVENTION

[0002] There are a variety of heavy equipment vehicles currently on the market. Tractors, bulldozers, wheel loaders, skid loaders, and backhoes are just a few examples. These machines may be used in construction, landscaping, farming and industry for various functions, such as lifting heavy material and digging dirt. Generally, there are different attachments that are placed on the vehicle to perform various functions. For example, a box blade picks up dirt, debris, and heavy material, while the ripper breaks up soil and concrete. Generally, these come as separate attachments that must be changed when a user wishes to perform different tasks. A box blade attachment obviously cannot perform the same functions as a ripper attachment. There is a need for a vehicle attachment that can be used for a variety of functions--collecting earth, digging, breaking up soil and concrete, etc.--without necessarily having to change the attachment.

[0003] There are a multitude of heavy equipment vehicle attachments that already exist; however, these are for the most part intended for a single function, such as digging or breaking up compacted soil/concrete or collecting material. Relevant art to the present invention includes U.S. Pat. No. 3,536,222, issued to Patnode on Apr. 22, 1968. It describes a standard-issue bucket attachment. U.S. Pat. No. 3,700,131 issued to Westendorf on Oct. 24, 1972, is a grab fork attachment. U.S. Pat. No. 3,765,109, issued to Daviduke on Oct. 16, 1973, is a blade for a loading bucket to ease collection. U.S. Pat. No. 3,795,070, issued to Bronson et al. on Mar. 5, 1974, is a multipurpose bucket. This invention has an extendable bucket used for construction purposes that has removable teeth on the base of the bucket, but cannot be used as a grapple, ripper or box blade. It is intended primarily for use as an excavating tool and for collecting material and is limited in the type of tasks it is able to perform.

[0004] U.S. Pat. No. 3,912,092, issued to Bolton et al. on Oct. 14, 1975, is a tractor lift. U.S. Pat. No. 3,966,064, issued to Felburn on Jun. 29, 1976, is a multipurpose vehicle. This invention is not as relevant to the present invention as it is a vehicle designed to be used as a forklift, tow truck with hoist, a tractor for towing any four-wheel vehicle, a load bed truck, or a tractor for supporting and towing a semi-trailer. It is less applicable to worksites, including construction and farming projects.

[0005] U.S. Pat. No. 4,038,766, issued to Felstet on Aug. 2, 1977, is a bucket ripper tool. This is a single attachment on an existing bucket and is limited in its functionality. U.S. Pat. No. 4,056,205, issued to Etzler IV on Nov. 1, 1977, is a loader attachment. It is intended to improve upon existing buckets by the addition of tines, but cannot perform four functions in one. U.S. Pat. No. 4,151,664, issued to Maura on May 1, 1979, is a ripper attachment. U.S. Pat. No. 4,279,085, issued to Arnold on Jul. 21, 1981, and U.S. Pat. No. 4,315,375, issued to Shinn on Feb. 16, 1982, are both earth moving and excavating buckets.

[0006] Hence, as seen in the aforementioned patents, there is no device attachment for a heavy equipment vehicle that can perform four separate functions at once. There is a need for a device that will allow a user to complete four distinct functions with a heavy equipment vehicle without having to change the attachment. There is a need for a device that can be used as a box blade, grapple, ripper, and bucket interchangeably without the hassle of stopping work each time to change the attachment.

[0007] It is expected that none of the relevant art can accomplish these objectives, as existing models of attachments only accomplish one task at a time or are primarily intended for different uses than the present invention, and thus the present invention provides a simple and adequate solution to the existing problem.

SUMMARY OF THE INVENTION

[0008] The present invention aims to solve the problem of requiring different attachments to perform various functions for a standard heavy equipment vehicle such as a skid loader. A skid loader, also called a skid steer, is a compact low-capacity machine used for pushing and lifting material and digging. With the present invention, the user has the ability to perform four separate functions with only one single attachment. The present invention, when attached to the standard vehicle, is used as a 1) box blade; 2) grapple; 3) ripper; and 4) bucket with front cutting edge. The single attachment is adaptable to various vehicles of different brands, including but not limited to John Deere, Caterpillar, and Bobcat vehicles.

[0009] A box blade is typically designed to be mounted on the rear of a heavy equipment vehicle such as a tractor. The blade is an attachment that is primarily used to move dirt. Essentially, it is a bucket with a large volume and is hydraulically powered with arms that raise and lower the bucket. It is mounted through a three-point hitch and can be lowered to the ground and as the vehicle moves forward, it collects debris through the opening between the base and back wall of the bucket, where there is a sharp cutting edge and void area. There are "wings" on the sides, which facilitate the entry of debris into the cavity, and it therefore has storing capabilities to collect and hold dirt/debris in the bucket. Additionally, the blade can pivot in its circumference to make dirt move left or right. The front and rear cutting edges are made of steel.

[0010] A grapple is an attachment that is designed to grip material such as logs for loading onto the machinery. It is a hinged mechanism capable of opening and closing mechanically. In the present invention, the grapple is comprised of two hydraulically operated arms with integrated ripper teeth.

[0011] A ripper is a heavy claw used to break up compacted soil and stumps. It is generally placed on the rear of a bulldozer and can also be used to break up pavement. Ripping rock breaks up a ground surface into rubble so that it is more easily transported. For agricultural purposes, ripping up very hard earth is done to facilitate ploughing. The ripper may come as a single or in multiple shanks, depending on the preferences of the user. Generally, however, only a single shank is used for heavy ripping (Wikipedia.org). The present invention has alloy tips that are welded with a hard-face mechanism and are not removable.

[0012] The final purpose of the present invention is to be used as a standard bucket with a front cutting edge. The bucket can hold from 1 to 1.75 cubic yards of material and per the preferences of the user can come customized with teeth extending from the base, or a smooth edge with no teeth. The smooth edge would be used on projects taking place on asphalt so as not to ruin the concrete, and the edge with teeth is used for different projects such as digging dirt.

[0013] The principal advantage of the present invention is that with one single attachment the user can perform four distinct functions. With only one single attachment, the present invention can be used as a box blade, grapple, ripper or bucket with cutting edge. Worksite projects can be completed in less time, as there is no need to change the attachments of the heavy equipment vehicle. Additionally, the present invention will save a user money as there is no need to purchase four separate attachments, as the present invention is 4-in-1. The hydraulic-powered heavy equipment vehicle enables precise manipulation of the attachment via automated controls. It is anticipated that the present invention is a vast improvement on relevant art because of its unique and useful combination of distinct elements.

DRWDESC:

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is an environmental view of the present invention.

DETDESC:**DETAILED DESCRIPTION OF THE PRESENT EMBODIMENT**

[0015] As shown in FIG. 1, the present invention is comprised of a standard bucket 5 with a main frame, comprising a right wall 10 and right cutting edge 20; a left wall 30 and left cutting edge 40; a base 50; a back wall 60; a pair of grapple arms 65 extending over the main frame that pivot vertically; a front cutting edge 70; a back cutting edge 80; a tooth bar 90; hydraulic cylinders 100; grapple bar 110; and ripper teeth 120.

[0016] Please note that the right grapple arm is not pictured as to provide optimal visibility of the inner section of the bucket 5, comprising base 50, back wall 60, and back cutting edge 80.

[0017] The present invention serves as a grapple attachment wherein the grapple is comprised of two arms 65 held together by and operated through a tooth bar 90 and further supported by a grapple bar 110. Hydraulic cylinders 100 extending from the topmost portion of the main frame bucket 5 control the grapple arms 65. The present invention pivots at the hydraulic cylinder shafts 100 of the grapple arms 65 and is useful for transporting, pushing and ripping earth or material such as concrete, and digging. The grapple arms 65 extend and lock down over the cutting edge. Fully extended, the grapple arms 65 can reach forty-eight inches from the base 50 of the bucket 5. Each grapple arm 65 is further comprised of three ripper teeth 120.

[0018] The present invention serves as a ripper attachment wherein the ripper is comprised of three ripper teeth 120 on each grapple arm 65, which extend over the lower plane/base 50 of the bucket 5. These teeth 120 are used to rake, rip, and assist in the collection of material. The teeth 120 are preferably placed $10\frac{12}{12}$ apart and are fourteen inches in length. The rippers can also be used to rake combination debris in reverse, meaning a user can pull up debris without pulling up dirt and destroying the earth. This is especially useful for clean-up of construction projects or the devastation wrought by hurricanes or tornadoes.

[0019] The present invention serves as a box blade attachment wherein the box blade is comprised of the base 50, back wall 60, and back cutting edge 80. The back wall 60 of the present invention is cut out at a fifteen-degree angle on the lower right and left corners, and the back wall 60 and base 50 therefore serve as a box blade. The bucket 5 can therefore be used to cut forward and perform regular digging.

[0020] The present invention serves as a standard bucket with front cutting edge, wherein the bucket is comprised of the base 50 of the bucket 5, the right cutting edge 20, left cutting edge 40, and the front cutting edge 70. These cutting edges 20, 40 and 70 are used to dig, cut, and collect material. The main frame of the bucket 5 remains similar to a standard bucket.

[0021] If the tooth bar 90 is set in the center of the bucket 5, material can get caught inside and bend the tooth bar 90, and repair or replacement of the tooth bar 90 is costly. The tooth bar 90 is therefore moved out of the affliction zone in the plane of the bucket 5 at the pivot point of the hydraulic cylinder shafts 100. The tooth bar 90 is moved to and mounted on the back wall 60 of the main frame bucket 5.

[0022] Alternative embodiments of the present invention include different-sized frames (or buckets 5) so that the present invention may be accommodated for any type of heavy equipment vehicle. There are three sizes, 60, 76 or 90 in width, for the main frame bucket 5. The operation is of course the same for each size. The preferred measurements of the present invention for the 76 frame are as follows:

[0023] Backwall: $21 * 76 * \frac{14}{12}$

555552 (11) 20070107270 (Note: This is a Patent Application only.)

[0024] Front cutting edge: 6[Doubleprime]*[Threequarters][Doubleprime]*76[Doubleprime]

[0025] Rear cutting edge: 6[Doubleprime]*[frac12][Doubleprime]*76[Doubleprime]

[0026] Additionally, the present invention may have an alternative embodiment wherein there are seven evenly spaced teeth extending horizontally from the base of the bucket 50. These seven evenly spaced teeth reach outwards horizontally from the lower plane/base 50 of the bucket 5 and are used to enhance the front cutting edge 70 for digging projects. Another alternative embodiment of the present invention is where the base 50 of the bucket 5 would be comprised of individual fingers, or tines, used for shifting smaller material.

[0027] Having illustrated the present invention, it should be understood that various adjustments and versions might be implemented without venturing away from the essence of the present invention. The present invention is not limited to the embodiments described above.

ENGLISH-CLAIMS:

Return to Top of Patent

1. A multipurpose attachment for a heavy equipment vehicle, comprising a bucket; a grapple; a ripper; and a box blade.

LOAD-DATE: August 29, 2007